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DESCRIPTION

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A TRANSLATION SYSTEM AND A MULTIFUNCTION

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COMPUTER, PARTICULARLY FOR TREATING TEXTS AND

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TRANSLATION ON PAPER

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Technical Field

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This invention has for object a translation system and a multifunction computer, particularly for treating texts and translation on paper.

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The translation system is also part of this invention.

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Background Art

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In prior art there is a great plurality of computers able to do translations and machine translation systems.

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The most known ones are the following :

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US-5677835 - Oct. 14, 1997 - in the name of Caterpillar Inc., Peoria, IL, USA

16

This substantially regards:

17

a system of integrated computer-based processes for monolingual information development and multilingual translation.

19

An interactive text editor enforces lexical and grammatical constraints on a natural language subset used by the authors to create their text, which they help disambiguate to ensure translatability.

23

The resulting translatable source language text undergoes machine translation into any one of a set of target languages, without the translated text requiring any post-editing.

26

US-5510981; Oct. 28, 1993; (International Business Machines Corporation, Armonk, NY), regards a language translation apparatus and method using

1 context-based translation models:

2 In particular:

3 An apparatus for translating a series of source words in a first  
4 language to a series of target words in a second language. For an  
5 input series of source words, at least two target hypotheses, each  
6 including a series of target words, are generated.

7 Each target word has a context comprising at least one other word  
8 in the target hypothesis.

9 For each target hypothesis, a language model match score  
10 including an estimate of the probability of occurrence of the series  
11 of words in the target hypothesis.

12 At least one alignment connecting each source word with at least  
13 one target word in the target hypothesis is identified. For each  
14 source word and each target hypothesis, a word match score  
15 including an estimate of the conditional probability of occurrence  
16 of the source word, given the target word in the target hypothesis  
17 which is connected to the source word and given the context in the  
18 target hypothesis of the target word which is connected to the  
19 source word.

20 For each target hypothesis, a translation match score including a  
21 combination of the word match scores for the target hypothesis  
22 and the source words in the input series of source words.

23 A target hypothesis match score including a combination of the  
24 language model match score for the target hypothesis and the  
25 translation match score for the target hypothesis. The target  
26 hypothesis having the best target hypothesis match score is output.

27 US-5384701 - June 7 , 1991 in the name of British  
28 Telecommunications public limited company, London, England ,

1 regards a Language translation system, and in particular:  
2 A language translation system for translating phrases from a first  
3 language into a second language comprises a store holding a  
4 collection of phrases in the second language.

5 Phrases input in the first language are each characterized on the  
6 basis of one or more keywords, and the corresponding phrase in  
7 the second language is output. Such a phrasebook approach  
8 enables what is effectively a rapid and accurate translation, even  
9 from speech.

10 Since the phrases in the second language are prepared in advance  
11 and held in store, there need be no problems of poor translation or  
12 ungrammatical construction.

13 The output may be in text, or, using speech synthesis, in voice  
14 form. With appropriate choice of keywords it is possible to  
15 characterize a large number of relatively long and complex  
16 phrases with just a few keywords.

17 US-5338976 - June 16, 1992, in the name of Ricoh Company,  
18 Ltd., Tokyo, Japan, regards an Interactive language conversion  
19 system; and in particular:

20 a language conversion system includes a database of expression  
21 patterns in the object language, a relevance evaluation mechanism  
22 for evaluating a relevance of each expression patterns in the  
23 object language with respect to an input in the original language,  
24 a retrieval and identification mechanism for retrieving and  
25 identifying from the input in the original language information  
26 requested by the expression pattern in the object language  
27 required to generate an output in the object language, a selection  
28 mechanism for selecting the expression pattern in the object

1 language conforming to the input in the original language  
2 depending on the relevance evaluated in the relevance evaluation  
3 mechanism, an output mechanism for generating the output in the  
4 object language based on the required information retrieved and  
5 identified from the input in the original language by the retrieval  
6 and identification mechanism, and a control mechanism for  
7 controlling operation sequences of the relevance evaluation  
8 mechanism, the retrieval and identification mechanism, the  
9 selection mechanism and the output mechanism.

10           **US-5659765** : Machine translation system in the name of  
11 Toppan Printing Co., Ltd., Tokyo, Japan, filed on March 14, 1995,  
12 claims :

13 A machine translation system comprising:  
14 - a first language;  
15 - second input means for inputting a second character string  
16 written in a second language;  
17 - display means for simultaneously displaying the first and second  
18 character strings input from said first and second input means;  
19 - linking means which has first designating means for designating  
20 a third character string included in the first character  
21 - string displayed by said display means, and second  
22 designating means for designating a fourth character string  
23 included in the second character string displayed by said display  
24 means, and links the third and fourth character strings with each  
25 other;  
26 - recording means for recording the third and fourth character  
27 strings linked by said linking means as a pair; and  
28 - means for detecting the character string which is most similar to

1 an original character string written in the first language from a  
2 plurality of recorded third character strings, and translating the  
3 original character string into a character string written in the  
4 second language by using a fourth character string linked with  
5 the detected character string.

6 US-5426583 - Jan. 27, 1994 - in the name of Uribe-  
7 Echebarria Diaz De Mendibil; Gregorio, Erandio, Bilbao, Spain,  
8 regards an Automatic interlingual translation system, claiming :  
9 - a method for use in a computer to automatically translate a first  
10 text based on a source language to a second text based on a different  
11 target language, said method comprising the steps of:

12 (a) analyzing said first text to achieve an arborescent-type  
13 clarification on morphological, syntactical and semantic  
14 characteristics of said first text;

15 (b) translating the analyzed text to a first intermediate  
16 language, wherein said first intermediate language contains  
17 structural characteristics of said source language;

18 (c) integrating the translated text into an interlingua,  
19 wherein said interlingua contains morphological,  
20 syntactical, and semantic features of a plurality of languages;

21 (d) translating the integrated text to a second intermediate  
22 language, wherein said second intermediate language contains  
23 structural characteristics of said target language; and

24 (e) converting the translated, integrated text to said second  
25 text.

26 US-4604698 - Dec. 22, 1983 - in the name of Sharp Kabushiki  
27 Kaisha, Osaka, Japan, regards an Electronic translator including  
28 character input keys for inputting a first language word, a

1 translator for translating the inputted first language word into the  
2 second language word, a retranlator for retranslating the second  
3 language word back to the first language word, and a display unit  
4 for displaying the inputted word, translated word and retranslated  
5 word.

6 **US-4439836** Oct.- 22, 1980 - in the name of Sharp Kabushiki  
7 Kaisha, Osaka, Japan, regards an Electronic translator, claiming:  
8 an electronic translator device for obtaining a second word  
9 represented in a second language equivalent to an input word in a  
10 first language, comprising:

11       input means for entering the input word;  
12       first memory means for memorizing a plurality of first  
13 words in the first language, each of said first words  
14 comprising one or more first letters which remain  
15 unchanged regardless of inflection and one or more second letters  
16 which change according to inflection;

17       address means operatively connected to said input means and  
18 responsive to entry of the input word for addressing  
19       said first memory means to develop one of the plurality of  
20 first words;

21       detection means operatively connected to said first memory  
22 means and responsive to said address means for  
23 detecting eqivalency between the input word and said first  
24 letters of respective first words;

25       second memory means for memorizing a plurality of second  
26 words in the second language corresponding to first  
27 words stored in said first memory means;  
28       first means operatively connected to said detecting means

1 for activating said second memory means whereby said  
2 second memory means develops a second word  
3 corresponding to the input word when the input word is equivalent  
4 to one of said first words; and

5 second means operatively connected to said detecting means  
6 for indicating that one of said first words in said first memory  
7 means comprises a noninflected form of the input word.

8 US-4633435 - July 22, 1985 - in the name of Sharp  
9 Kabushiki Kaisha, Osaka, Japan, regards an Electronic language  
10 translator capable of modifying definite articles, and in particular  
11 regarding an electronic translator is featured in which sentences  
12 as stored are modified by replacing one or more words in one of the  
13 original sentences with one or more new words and by changing  
14 automatically one or more additional words in the original  
15 sentence, depending on the nature of the one or more new words  
16 entered in the sentence. For example, the one or more additional  
17 words may be definite articles or prepositions.

18 US-4831529 - Feb. 12, 1987 - in the name of Kabushiki  
19 Kaisha Toshiba, Kawasaki, Japan, regards a Machine translation  
20 system, claiming:

21 a machine translation system for translating a first language into a  
22 second language, which comprises:

23 input means for entry of an original written sentence in the  
24 first language into the system;

25 dictionary means having at least a first dictionary for  
26 storing various words in various parts of speech and their

27 translation in the second language respectively  
28 corresponding to the words in the first language, and a second

1            dictionary for storing various words designated as nouns  
2         corresponding to words in the first language;  
3            translation means for analyzing the original written  
4         sentence in the first language, for retrieving said dictionary  
5         means and for executing the translation processing of the input  
6         original, when any same word designated as nouns stored in the  
7         first dictionary is found in the second dictionary, the word stored  
8         in the second dictionary takes precedence over that in the first  
9         dictionary in the translation means; and  
10          output means for producing translated sentences in the  
11         second language obtained from said translation means.

12            US-5020021 - Jan. 10, 1986 - in the name of Hitachi, Ltd.,  
13         Tokyo, Japan, regards a system for automatic language translation  
14         using several dictionary storage areas and a noun table, and in  
15         particular regarding a translation method for a machine  
16         translation system provided with apparatus for parsing a source  
17         language sentence and for forming a target language translation  
18         in which a phrase omitted in the source language sentence is  
19         identified, and a word or phrase to be inserted for the omitted  
20         phrase is selected from stored words and phrases. For identifying  
21         an omitted phrase, a sentence pattern corresponding to a predicate  
22         in the source language sentence is formed so as to include not only  
23         cases governed by the predicate but also a semantic feature for  
24         each case. By comparing the source language sentence with the  
25         sentence pattern, a case which is omitted in the source language  
26         sentence but cannot be omitted in the target language translation  
27         is identified. For determining a word or phrase to be placed at the  
28         position of the omitted phrase, the nouns having appeared in the

1 source language text is stored in a noun, together with the  
2 semantic feature, gender, person and number of each noun is  
3 searched for a noun having the same semantic feature as the  
4 omitted phrase. When a target language translation of the source  
5 language sentence is formed, a pronoun having the same gender,  
6 person and number as the omitted phrase is used as a target  
7 language equivalent for the omitted phrase, and thus a target  
8 language translation which is grammatically correct, is obtained.

9 US-5093788 - June 25, 1987 - in the name of Sharp  
10 Kabushiki Kaisha, Osaka, Japan, regards a Translation machine  
11 system with splitting and combining of sentences.  
12 Same claims an electronic translation machine system for  
13 translating multiple sentences from a source language to a target  
14 language comprising:

15 input means for inputting a plurality of source sentences;  
16 first buffer means in communication with said input means  
17 for storing said source sentences;  
18 position designation means coupled with said first buffer  
19 means for designating a division point separating a selected  
20 source sentence into parts and for inserting a position  
21 designation symbol in said selected source sentence;  
22 splitting means in communication with said first buffer  
23 means for scanning said selected source sentence for said  
24 position designation symbol and, once encountered, for  
25 splitting said selected source sentence into parts and for  
26 storing said parts in said first buffer means; and translation  
27 means for translating the parts of said selected source sentence  
28 stored in said buffer means from said source language to said target

1 language.

2 US-5175684 - Dec. 31, 1990 - in the name of Trans-Link  
3 International Corp., Honolulu, HI, regards an Automatic text  
4 translation and routing system, claiming:

5 - a machine translation system comprising:

6 a machine translation module which is capable of  
7 performing machine translation from input text of a source  
8 language to output text of a target language, said machine  
9 translation module having a plurality of target language  
10 submodules for performing machine translation into a plurality of  
11 different target languages;

12 a receiving interface for receiving via a first  
13 telecommunications link an electronic input which is divided into  
14 pages,

15 said input pages including a cover page having predefined  
16 fields containing system information therein and at least one text  
17 page in a source language, wherein said cover page includes at  
18 least a first predefined field designating an address of an addressee  
19 to which translated output text is to be sent, and a second  
20 predefined field designating a selected one of the plurality of  
21 different target languages into which the at least one text page is to  
22 be translated, and

23 wherein said receiving interface includes a recognition  
24 module capable of electronically recognizing the address of the  
25 addressee designated in said first predefined field of the cover page  
26 of the received input pages, and the selected target language  
27 designated in said second predefined field of the cover page;

28 a sending interface for sending output text generated by said

1 machine translation module to an addressee via a second  
2 telecommunications link; and

3 control means coupled to said receiving interface, said  
4 machine translation module, and said sending interface for  
5 recognizing the address and target language designated in said  
6 predefined fields of said cover page, for controlling said machine  
7 translation module to generate output text of the designated target  
8 language from the input text of the source language, and for  
9 operating said sending interface to automatically send the  
10 translated output text via the second telecommunications link to the  
11 designated address recognized from said predefined fields of said  
12 cover page.

13 U.S.-5303151 - Feb. 26, 1993 - in the name of Microsoft  
14 Corporation, Redmond, WA, regards a Method and system for  
15 translating documents using translation, and claiming:

16 - a computer system for translating a source language document  
17 written in a source language to a target language document written  
18 in a target language, the source language including a multiplicity  
19 of source terms and the target language including a multiplicity of  
20 target terms, the computer system including a display screen, the  
21 source language document, a product glossary having a plurality of  
22 source terms from the source language and a plurality of target  
23 terms from the target language, each source term being associated  
24 with the corresponding target term which translates the source  
25 term into the target language, the computer system comprising:

26 means for producing a translation screen portion on the  
27 display screen, the translation screen portion including a current  
28 insertion point;

1 means for displaying the source language document on the translation  
2 screen portion;

3 means for comparing each of the plurality of source terms from the  
4 product glossary with the source terms in the source language document;

5 inserting means for inserting a character adjacent to the source term  
6 in the source language document, in response to each comparison by the  
7 comparing means which produces a match between one of the source terms  
8 in the source language document and one of the source terms in the product  
9 glossary;

10 means for associating in an index file the inserted character with a  
11 target term from the product glossary that translates the matched source  
12 term from the source language into the target language;

13 means for inputting an insert target term command which contains a  
14 translation request character corresponding to the inserted character;

15 means for retrieving the translation request character from the insert  
16 target term command;

17 means for retrieving from the index file the target term associated with  
18 the retrieved translation request character; and

19 means for inserting the retrieved target term on the translation screen  
20 portion in response to the insert target term command.

21 EP-A-0176858(SHARP KK) April 1986, discloses:

22 A translation system performing translation from a first language  
23 into second language under an interaction mode between said  
24 translation system and an operator, comprising means for  
25 inputting original sentence to be translated, means for translating  
26 the input sentence of said first language into output sentence of  
27 said second language, wherein the operator inputs information  
28 relating to at least one word of the input sentence then the  
29 translation is performed on the basis of said input information.

30 Prior art drawbacks

31 The prior art drawbacks substantially consist in that they do not allow  
32 the operator to reach a suitable operational performance, even in the  
33 latter EP-A-0176858(SHARP KK) solution, the operator identifies  
34 first the qualification of input sentence word/s, then translation is  
35 performed.

36 Purpose of the present invention

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1            Purpose of the present invention is that of obviating the above  
2 mentioned drawbacks.

3            Essence of the invention

4            The problem is solved as claimed by a machine translation system and  
5 respective translator which comprises such system, of the type in which the  
6 set-up of:

7            - first means for the storing of words and strings with more words with  
8            respective correct translations forming a dictionary of words and sentences  
9            or sentence portions;

10          - second means for receiving a text to be translated on a screen field and

11          - third means for storing the translated text into a second screen field;

12          - fourth means for progressively searching the words of the text to be  
13          translated and comparing them with said first means words for obtaining a  
14          progressive translation; and

15          - means for having an option between a completely automatic form of  
16          translation or an interactive one or vice versa before beginning the  
17          translation, in which, during said interactive translation option, are additionally  
18          provided:

19          - means for displaying on a disappearing window on said screen:

20          - the words missing during the word search and

21          - the sentences translated when each sentence translation is complete; and

22          allow their correction and storage;

23          characterized in that, ~~during~~ in said interactive translation option the  
24          following are additionally provided:

25          • means for highlighting and storing a translated sentence word or portion,  
26          concerning a ~~possible~~ modification by the operator and

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- 1     • means for highlighting and storing the corresponding ~~translated~~ sentence ,
- 2     word or portion to be translated.
- 3     • means for storing a respective behaviour code of the modification of said
- 4     sentence, word or portion;
- 5     • for integrating said first storage means with them forming a dictionary of
- 6     words and sentences or sentence portions for self-modification in the next
- 7     sentences to be translated.

8     Advantages of the new solution

9                 In this way there is the advantage of giving the operator the possibility  
10      of progressively implementing during the same translation not only the missing  
11      words or the repetitive and common sentences as in the prior art known  
12      systems, but also sentence fragments, which thanks to the respective  
13      behaviour code given by the operator will be inserted and suitably be self-  
14      modified in the next translation sentence.

15     Thus, thanks to the well known repetitiveness of the expressions in the  
16      translation documents, the system automatically and rapidly ~~suit~~ continues  
17      to ~~the~~ this new translation ~~field~~ domain giving, after the first translated text  
18      ~~pieces~~ modifications, thanks to said auto-learning of corrections ( FM1 -  
19      FM2, FM3) with said behaviour code ( FM4 ) , a resulting maximum  
20      translation level and absolutely peerless in quality respect to any known  
21      translation system.

22     The tests carried out gave such amazing results that even after only a little  
23      translation the errors in each sentence decrease to the minimum almost  
24      immediately reaching the average error/sentence value comprised between 1  
25      and 2, for then reaching the error/sentences value >1.

26     Preferential variations

27     The presence of ~~of~~ the following is additionally provided :

28     AA. Means which provide at least three control and input lines:

1     • the first upper one as sentence to be translated/sentence portion  
2     corresponding to the correction;  
3     • the second one as translated sentence/correct sentence portion;  
4     • the third one as a line for inputting the behaviour code  
5     corresponding to the correction.  
6     • advantageously the presence of a line which by means of a series  
7     of numbers indicates how the sentence composition was obtained,  
8     for single words and word fragments, thus allowing to let the  
9     operator know how the system found the translation sources  
10    (single words combined with sentence fragments) is provided.

11    Thus there is the advantage of operating fastly and with the  
12    highest speed, having the possibility of carrying out a suitable  
13    control before the inputting.

14       BB. A translation interface comprising at least two fields  
15    vertically scrollable in parallel; adjacent and placed one close to  
16    the other, one for the document to be translated and one for the  
17    translation, being provided means which:

- 18     • allow the simultaneous size variation of both fields, one for the  
19    text to be translated and one for the translated text, and  
20     • keep the two fields at the same height;  
21     • scroll the two fields in parallel and simultaneously;  
22     • adjust the width of both fields in a proportion inverse to the  
23    length of the two documents: original and translation.

24    Thus the great advantage of being able to control and correct the  
25    translation by comparing it substantially aligned with the original.

26       CC. During the display of an interactive translation window,

- 27     • A control which, after selecting a sentence word or portion to be  
28    translated in the window, enables the consultation of a parallel

1 dictionary which suggests alternative translations of the selected  
2 word. Thus giving the operator the possibility of consulting on line  
3 a respective consultancy dictionary.

4 • A control for stopping the interactive translation in process,  
5 which stores in accumulation in a pair of separate fields  
6 • the already translated and corrected part and  
7 • the corresponding part of the document which had to be  
8 translated,

9 and this is for leaving only what remains of the still untranslated  
10 part in the field of the translation in process in order to recover it  
11 and the last not yet corrected sentence being translated  
12 corresponding to the first sentence of the not yet translated  
13 translation part, which at that moment was in the interactive  
14 window for the control.

15 It is thus possible to interrupt an interactive translation without  
16 losing anything of what was previously translated correctly, and  
17 further to intervene in post-correction on the system by acting  
18 both on the part still to be translated and on the one just translated.  
19 Thus it is possible storing all the corrections made later, allowing to  
20 use them again in the next translations.

21 **DD.** Means for performing the post-correction after the text  
22 translation, on field of the translation, by means which:

23 • locating the cursor position in the correction area or otherwise if  
24 a portion is stored by highlighting, automatically calculate the  
25 number of corresponding sentences and words of the translated  
26 document from the source and,  
27 • on the basis of absolutely maintaining the punctuation positions,  
28 they provide in a screen window:

1     • the previously highlighted sentence portion in the correction  
2 zone or the concerned whole sentence located by the cursor  
3 presence since the last correction and  
4     • the corresponding sentence of the document to be translated, in  
5 order to allow the operator to delimit by highlighting the sentence  
6 fragment corresponding to the one concerned with the correction  
7 and provide a corresponding behaviour code for the storage,  
8 substantially in a way similar to what operated during the  
9 interactive translation.

10       EE. Above said pair of fields, a control bar is provided for the  
11 control operations substantially forming a "T"-shaped base  
12 interface in which the upper cap of the "T" is the control bar by a  
13 combination of buttons and the "T" stem substantially separates the  
14 right field from the left field of said pair of fields of the document  
15 to be translated and translated document. Thus the whole is  
16 combined and integrated in a maximum performance.

17       FF. Considering that the scanners are always dissociated  
18 from the computer and considering that this is caused by the  
19 dimension of the scanner and by the practical impossibility to  
20 manipulate sheets within the computer itself, it was thought to  
21 associate to the computer itself a scanner integrated in the case of  
22 the computer, and to avoid said dimension of the manipulation of  
23 the paper sheets to be read, it was innovatively thought to adopt the  
24 sideways entry and exit of the paper sheet, the all associated to OCR  
25 system for characters recognition.

26       In this way the paper document to be translated is automatically  
27 loaded in the machine and in the translation system for eventual  
28 control, rectification and following translation.

1     The result of this structure substantially involves the possibility of  
2     integrating the scanner with the computer itself and therefore a  
3     sensitive improvement of the total time for effecting the  
4     translation from a paper document.

5                 GG. By using this advantageous and innovative system it is  
6     possible to also apply the respective printer on the opposite side of  
7     the scanning apparatus.

8     **Description of at least one embodiment of the invention**

9     These and other advantages will appear from the following  
10  description of a preferred solution, with the aid of the included  
11  drawings, whose details are not to be considered limitative but only  
12  given as examples.

13  Figure 1 is a view of the translating computer.

14  Figure 2 is a sectional view of the scanner body inserted in the  
15  computer case.

16  Figure 3 is a view with blocks scheme of the computer structure  
17  and working system as in previous figures.

18  Fig.4 is a view of the image that appears on the screen during the  
19  interactive translation and of the window, for the control,  
20  correction and self-learning of the portion concerned with the  
21  correction.

22  Fig.5 is a visualization of the completed translation, for the final  
23  checking and following eventual post-correction.

24  Figs. from 6 to 9 concern a series of subsequent phases of the  
25  translation process in the interactive-automatic way, by using a  
26  module in the specific case a bi-directional one recalled by the  
27  Multilingual main management system (Fig.4-5) "English-Italian-  
28  English", bi-directional module, being there a plurality of these

1 modules according to the possible combinations between the  
2 different languages and recalled time by time by the main system,  
3 each module being able also to operate singularly without the  
4 assistance of the management system or main management.  
5 Figure 10 represents one of the cards showing the interactive  
6 storage means of the words and sentence fragments that  
7 characterize the system.  
8 Figure 11 represents the option card for the choice before the  
9 translation of the desired work domain, technology, medicine,  
10 agriculture, etc.  
11 Figure 12 represents the storage device of the new teaching words  
12 and sentence fragments encoded during the interactive correction  
13 operation.  
14 Figure 13 represents the choice device of the work sector divided in  
15 a plurality of dominions from 1 to 33 with a customizable optional  
16 34 in the specific case the sector 10 (electronics) being selected.  
17 In the case of figures 4 and 5 only one sentence was quoted for  
18 simplicity, but it is evident that because sliding fields are involved,  
19 the document to be translated may be a multipage one.  
20 According to the figures and in particular referring to Fig.1 it is  
21 noticed that the computer 1 has a desktop parallelepiped-like  
22 shaped with frontal entry for disks, CD etc. (11); side entry  
23 according to the invention for scanner (12) and respective outlet  
24 on the same side (13) of the scanned sheet.  
25 The printed sheets exit with feeding of the same paper on the side  
26 of the scanner (12) being able be provided on the other side  
27 (opposite side) or by feeding by extractable underlying drawer  
28 always on the side.

1     The computer 1 obviously is provided of means for realizing a  
2     complete operative element with keyboard 2, mouse 3 and monitor  
3     or screen 4 both in traditional version and in version "LCD" or  
4     other equivalent.

5     The scanner group (122) is integrated in the computer case (1) and  
6     is controlled by the push-button (14), and in a simplified version,  
7     the paper sheet (P) enters from the side M1 and comes out through  
8     the side M2 to then be conveyed by conveying rollers:

9         • in the solution of Fig.1 in exit from the same side by 180° rotation,  
10    thus avoiding to make the paper sheet pass under or over the  
11    mother card of the processor;

12         • in an alternative solution with exit on the other side, where a  
13    printer group for points line of known art having the same  
14    substantial shape of the scanner of Fig.2 can be provided.

15    In such a case it is possible, by using the other push-button (15), to  
16    load from the scanner side (12) a white paper sheet "P" to make it  
17    come out as printed from the opposite side.

18    The printing group is not illustrated as it is of known art and  
19    substantially similar to that of the scanner where in the place of  
20    the scanning unit (127) a printing unit (e.g. an ink-jet or thermal  
21    one) is installed.

22    In particular the scanner group (121) is of the static type and  
23    protected in a case (122), and the sheet is made to scroll within it  
24    (P) entering into one side (M1) and getting out from the other one  
25    (M2).

26    A step motor controlled by the computer (15-PC-CPU) or separate  
27    processor ((14-OCR-CPU - 123), is provided for such purpose and it  
28    is operated by the control button external to the computer (14).

- 1    The motor (123) tows by belt 124 respective paper traction rolls
- 2    (125), placed along bearing transversal axis (125') and operating
- 3    by idle counter-rolls (1261), on an openable countercase (126) for
- 4    the inspection and eventual extraction of the jammed sheet during
- 5    the advancement.
- 6    A paper-presser 127 is provided in the lower countercase (126) to
- 7    press the advancing paper against the linear scanning unit of
- 8    known art (127) that includes the lighting device and the device to
- 9    send the reading to the respective processor (14-OCR-CPU) or
- 10   alternatively more simply to the same processor of the computer
- 11   (15-PC-CPU) where by known OCR program the reading is captured
- 12   and transformed in text "WP" for the translation or in case of a
- 13   drawing, stored separately in a scanned documents storing folder
- 14   (OCR or not).
- 15   The structure of the new translating computer or translation
- 16   station or translation desk, therefore preferably includes said
- 17   characteristics and at least (See Fig.3):
  - 18   - in the desktop parallelepiped case (1):
    - 19   • a central processor (15-PC-CPU) with respective management
    - 20   card and control which is connected to;
  - 21   Memory (RAM 16)
  - 22   Disk fixed memory (17-HDM)
  - 23   Extractable memories such as:
    - 24   - Magnetic memory disks (18-FDD)
    - 25   - Optic memory disks (19-CDD);
  - 26   The whole including at least a system or programme OCR (121 -
  - 27   OCR), and additionally being able and preferably providing a
  - 28   second processor for the separate treatment of the scanning (14-

1       OCR-CPU) which always controls the scanning group (121).  
2       Externally, as already said, the processor card (15 - PC-CPU) is  
3       linkable to the keyboard (2-KB), mouse (3-MAUS ), and Screen (4-  
4       DIS).  
5       In case of the presence of the second processor "dual processor  
6       computer", a processor will serve to the normal translation routine  
7       of (15-PC-CPU) and a processor (14 - OCR - CPU) which operates in  
8       parallel and is therefore also able to operate on the storage while  
9       the translation by the main processor continues.  
10      Thus it is possible having work overlaps and while one translates  
11     or works with the computer in WP, also doing other work, for  
12     example scanning, printing and other.  
13      Coming back to Figures from 6 to 9 it can be noticed that, in the  
14     specific case the bi-directional module "English-Italian-English" is  
15     indicated, able to operate also as "stand alone" and indicated with  
16     F1, being there many of these modules, each for language couples  
17     combination and having the same configuration with adjacent "T"-  
18     like parallel fields couples with the control bar placed on the upper  
19     part.  
20      Where the control types (always virtual push-buttons) are  
21     obviously different.  
22      The translation phases with interactive self-learning are the  
23     following ones:  
24      a1. Introduction of the English text in the left field in the desired  
25     way (import, copy and paste, writing or also coming from the  
26     automatic scanning system with characters recognition system  
27     (121-OCR), choice of the interactive translation mode (total quality)  
28     by pushing the button TQ and beginning of the translation;

- 1    a2. after the automatic translation of the first sentence, said  
2    interactive window 46 appears automatically having indicated  
3    (Fig.6):  
4    - in first line a numbers line that indicates in the specific case that  
5    the sentence has been translated word by word ( $1*4=4$ ), not having  
6    found prememorized sentences portions (in the case of Fig.4  
7    instead the sentence, longer, had the code  $1*3+6+1*1+3+3$  that  
8    means = the first three words translated singularly, then a 6 words  
9    string translated, then a single word and then two strings of 3  
10   words each. The puzzle thus made up has given the resulting  
11   sentence that as it can be seen is of enough acceptable quality.;  
12   - in the second line the sentence being translated;  
13   - in the third line the automatically translated sentence to be  
14   controlled.  
15   a3. The operator carries out the correction of the non appreciated  
16   sentence portion (computer system =processing system) that is  
17   highlighted (463) Fig.7);  
18   a4. the operator has either the possibility to go on by pushing "OK"  
19   (464) or to get out by pressing "Cancel" (465):  
20   -if he presses "Cancel" the system either optionally asks if he wants  
21   to consult one of the words being translated to supply alternatives  
22   of translation or it stops the translation by accumulating the  
23   translated in accumulator;  
24   - if he presses "OK" the window of Fig.8 appears in which it can be  
25   seen that in line 2 only the correct sentence fragment appears and  
26   he asks to adapt the correspondent original sentence portion  
27   accordingly to line 2, proposing in third line a qualification code;  
28   a5. By highlighting the portion, corresponding fragment of the

1 sentence being translated (4621) on the first line and by pushing  
2 "OK" (Fig.9),

3 a6. Fig.10 appears where on three lines the operator must check  
4 the teaching (4621-4631), in the specific case he corrects from  
5 "sofs" (automatically supplied by the processor because it ends with  
6 "a") = singular feminine noun in "soms" = singular masculine noun  
7 (4632), and by pushing "OK" (464), the teaching is automatically  
8 stored in the interactive memory (FM Fig.12), that includes:

9 - the field of the first fragment word for the research (FM1), the  
10 field of the fragment portion following the first word (FM2), the  
11 field of the translation (FM3, the field of the behaviour code (FM4),  
12 being further provided a personalization field (FM5), in function  
13 of the chosen sector or work domain (DM);

14 a7 Fig.11, the completely and perfectly translated and controlled  
15 sentence appears in the left field and the interactive window  
16 appears again proposing to the translator the control of the next  
17 sentence and so on.

18 With this system it was found:

19 - a practically perfect translation controlled by the operator;  
20 - a progressive teaching of the sentence fragments concerning the  
21 corrections avoiding the computer to repeat the previous errors;  
22 - the translation time is greatly reduced, going over 50% and with  
23 maximum quality.

2.4 In case in the Tq="total Quality" system, no more substantial errors  
25 were found (as for example the repetition of good translations as  
26 from window of Fig.11, it will be possible to opt for the automatic  
27 translation and post-correction ="postediting", in which always  
28 with the same method it will be possible to memorize the respective

- 1 corrections.
- 2 In the preferential solution the scanner (121) is substantially  
3 placed on the side and arranged for a sheet path substantially  
4 around of the scanning head (127), being the sheet in scanning (P)  
5 obliged to follow a substantially "C"-like path for entering into and  
6 getting out from the same side d, on the computer side, turning  
7 around the scanning head (127). In this way there is the very great  
8 advantage, of being able to extract the central body of the  
9 scanning group (122) that to such purpose is laterally enclosed  
10 within the "C" -like housing (126), for easily carrying out the  
11 maintenance and extracting an eventually jammed sheet.
- 12 In fact the computer is characterised in that said scanner group  
13 (121) is substantially made up of a substantially "C" -like case as  
14 paper guide (P), external (126), where the internal group (122)  
15 containing the reading head (127) and the paper advancement  
16 system (123-124/124'/124"-125) is inserted and laterally extractable.